Appendix B

Automated Command and Control

The capabilities of the Paladin howitzer have substantially changed the role of the POC. The emphasis at the POC shifts from providing technical fire direction to tactical fire direction and the C2 of three semiautonomous howitzers. The Paladin unit has a number of unique capabilities as well as some unique challenges to operate at its fullest capacity. Increasing automation means that information flow is accelerated and the demand for information, both into and out of the POC, is increased. This appendix provides information on AFCS capabilities, initialization procedures, and message traffic to assist in controlling the automation process.

COMMANDER'S CRITERIA

B-1. Commander's criteria are the supported maneuver commander's guidance for fire support translated into language usable by the battalion FDC computer. The FSCOORD, artillery battalion S3, and battalion FDO meet and develop commander's criteria for each maneuver mission or phase of a mission. The FA support plan or the battalion FDC tab to the FA support plan must contain commander's criteria. When AFATDS/IFSAS is controlling the battalion fires, this information is automatically part of the tactical fire control solution developed by the computer. However, this information must also be disseminated to each POC so that the maneuver commander's guidance for fire support and attack guidance are adhered to in case battalion FDC is not available. The battalion O&I section provides this information, and should be regularly queried to ensure this information is passed initially and updated as changes in the tactical situation occur.

AUTOMATIC FIRE CONTROL SYSTEM

B-2. To C2 the Paladin, it is important that personnel understand what the AFCS can and cannot do. It is not a stand-alone device but is an extension of the LCU. The howitzer COS cannot receive voice calls for fire and input grid coordinates to compute fire missions. The items discussed below are those the COS must input into the AFCS and report to the LCU.

PIECE STATUS

B-3. The piece status is reported to the POC in the form of the HOW;UPDATE report. The actual status in the HOW;UPDATE depends on directions given by the POC. The HOW;UPDATE received by LCU contains the howitzer grid location and altitude, date and time of arrival at the firing

position, operational status, AOF, maximum elevation, and powder temperature. Status codes used are as follows:

- Y = Operational in a fire area. This means the howitzer is given more authority within a POC-specified radius.
- O = Out of action. Determined automatically by the AFCS.
- M = Moving. Determined automatically by the AFCS.
- S = Stationary at a firing point.
- L = Linked with a TA asset.
- R = Relay linked with a TA asset.

AMMUNITION

B-4. The howitzer ammunition status is reported to the POC by use of the HOW;AMOUP report. This information is maintained in the LCU by howitzer and is consolidated for AFATDS/IFSAS reporting purposes on the AFU;AMMO report. Ammunition reported includes both on-board howitzer ammunition and ammunition available on the FAASV if the FAASV is in the PA.

MASK DATA

B-5. The gunner or section chief traverses the tube, elevating and/or depressing to measure site to crest. He then measures piece-crest range by using an AN/GVS-5 hand-held laser range finder or one of the methods described in FM 6-50, Chapter 6. The mask information is determined for each howitzer and is reported to the POC on the AFU;MASK report, where it is also maintained by howitzer. Each howitzer can report up to eight masks with a maximum of 24 masks stored at the LCU. It is not necessary for each howitzer to report eight masks. If the adjacent POC is not available and one POC must control six howitzers, the mask data may have to be redefined by the howitzer COS as directed by the POC. For example, the COS may be directed to report the three highest masks within his primary sector of fire.

MUZZLE VELOCITY

B-6. Each howitzer maintains its own MVV data. This information is also maintained by howitzer in the LCU database at the POC. The POC can request the current MVV data by using the HOW;REQUEST message format. This process is transparent to the Paladin. All calibration data entered into the AFCS are corrected for nonstandard conditions (projectile weight and propellant temperature) and appear at the POC as variations requiring no further processing. (Also refer to Appendix K.)

MISSION PROCESSING

B-7. The AFCS can process only one fire mission at a time. However, a stored priority Copperhead or FPF mission can be fired anytime it is requested. The AFCS can store up to ten targets, including one priority target.

B-8. Except for priority targets (FPF or priority Copperhead), the gunner or COS can review only stored targets for the purpose of preparing ammunition. The AFCS can process fire missions where the LCU has computed the firing data (firing data sent by FM;COMMDS message), or it may compute its own

data (HOW;MSN sent from LCU). In the normal mode of operation, the AFCS computes its own data based on tactical fire control information sent from the POC via the LCU.

B-9. If for any reason the AFCS should be unable to process information transmitted from the LCU, the AFCS automatically transmits a "be advised that" (BAT) or an "unable to execute" (UTE) plain text message to the LCU. The BAT or UTE PTM states the warning or reason for failure to process. Section II lists BAT and UTE messages.

INITIALIZATION

B-10. It is imperative that platoon and battery personnel be thoroughly briefed on the tactical situation and the role the unit is to play in accomplishing the commander's guidance for fire support. This information has a direct influence on the operational employment of the Paladin battery and its platoons. Information critical for howitzer sections is discussed below.

CALL SIGNS AND FREQUENCIES

B-11. Call signs and frequencies to be used by the howitzers must be known.

SURVEY CONTROL AND LOGISTICS POINTS

B-12. Location of SCPs and logistic points must be known.

PRIORITY SHELL-FUZE COMBINATIONS

B-13. This information is part of commander's criteria found in the FA support plan. It aids the howitzer COS in managing ammunition on the howitzer and FAASV to best support the operation.

COMMUNICATIONS PARAMETERS

B-14. (See Chapter 5 for communications parameters information.)

DATABASE INFORMATION

B-15. There are several ways to approach building the database. However, digital communications must first be established. Each howitzer and POC must input enough initial database information to enable digital communications between elements. Each howitzer must notify the POC when it is prepared to establish digital communications.

LCU Database

B-16. There are two options in constructing a database at the LCU:
- Build a complete database by selecting the weapon-dependent program and receiving all of the information directly from the individual Paladins.
- Modify an existing database, using database recording (DBR) DATABASE1 or DATABASE2 or FLEXIBLE DISC UNIT.

B-17. Selection of a database previously recorded normally is the option selected. Corrections are made and transmitted to the howitzer as needed. As a matter of SOP, the AUTO XMIT DATABASE messages should be YES

(selected). This allows automatic transmission of the HOW;SBT, MET;CM, AFU;REG, and SPRT;MAP anytime the format is executed or a HOW;REQUEST is executed. Otherwise, changes to the LCU database are placed in the input queue and require operator action for transmission to the howitzer(s). The LCU operator should enter all six howitzers (both platoons) in the SYS;SBT. These should be the first six entries. The adjacent platoon howitzers should have an entry of N in the T field. This eliminates the need to enter them in case the POC has to assume control of the adjacent platoon howitzers. However, do not enter the adjacent platoon howitzers (HOW;UPDATE) and ammunition (HOW;AMOUP) into the database. This results in incorrect platoon location and ammunition count reports to battalion.

AFCS Database

B-18. Each howitzer COS constructs his database on the basis of known data. Some of this information is provided by the POC:

- Net access (See Chapter 5).
- Net address (See Chapter 5).
    - Radio frequencies and call signs.
    - Date and time.

B-19. The remaining information for the AFCS is available at howitzer level (such as ammunition, load elevation, and time on target (TOT) response time). At the onset of operations, there may be no more than one or two SCPs where the howitzer(s) may initialize the navigation system. (This does not preclude other database information from being entered.) The POC may need only to tell the COS at which SCP to initialize. It is important to note that once the navigation system is initialized, it need not be done again unless a catastrophic failure or loss of survey control occurs.

ESTABLISH THE NET CONTROL STATION (INTRA-PLATOON)

B-20. Each POC is responsible to establish voice and digital communications within its platoon. Strict net discipline is essential because of the increase in radios. Unit TSOPs should specify procedures to establish voice and digital communications.

B-21. Voice communications checks should be made first on both voice and digital nets. If voice communications cannot be established, then digital cannot be established. Once each howitzer has completed initial database input, digital communications should be established. The POC should first send a time hack, after which the COS should request initialization. The LCU receives this as a HOW;REQUEST, which the LCU operator executes. If AUTO XMIT DATABASE messages is YES, then the HOW;SBT, AFU;REG, SPRT;MAP and MET;CM automatically transmit. It is important to note that this database information is not accessible to the howitzer COS and is controlled exclusively by the POC. If the POC is uncertain whether the AFCS has this information, it should be retransmitted. There are two reasons for transmitting the HOW;SBT before any other message: first, to check digital communications from LCU to AFCS: and second, so the howitzer knows its fire unit name (as found in BCS SYS;SBT). This keeps the LCU operator from

having to correct the fire unit name when a HOW;REQUEST is received from a howitzer.

B-22. Unlike digital transmissions to other subscribers, the POC, when transmitting to howitzers, may transmit to a single gun or make a single broadcast transmission to all guns. For example:

- SB:*/1/2/ / ;   Transmission to guns 1 and 2 only.
- SB:*/ / / / ;   Broadcast transmission to all guns.
- SB:*/1/ / / ;   Transmission to gun 1 only.

HOWITZER SUBSCRIBER TABLE (HOW;SBT)

B-23. The HOW;SBT is used to establish legal digital subscribers for each howitzer. The controlling POC should enter the backup POC in each HOW;SBT. This allows the backup POC to assume control of adjacent howitzers should the need arise.

HOWITZER MOVEMENT (HOW;MOVE)
HOW;MOVE FORMAT

B-24. The HOW;MOVE format is used to direct howitzer movement. This message gives the howitzer authority to move. When this format is used, it is important to understand the type of control the POC is granting the howitzer. If the POC intends the howitzer to occupy a single firing point, the radius given should be zero. If a firing area is desired, thereby allowing the howitzer freedom to select its own position, a radius greater than zero is specified. Whenever a radius greater than zero is specified, the howitzer is automatically granted move authority. In all cases, the POC should enter X in REPORT. When the howitzer arrives at the firing position, the AFCS automatically reports the arrival to the POC. If the howitzer is directed to a firing point (no move authority) and the howitzer moves more than 18 meters, the AFCS warns the operator and reports the movement to the POC. If the POC wants the howitzer to lay on a specific azimuth, the desired azimuth is placed in the center sector (CSECT) field. The left sector (LSECT) and right sector (RSECT) fields are used to orient the howitzer in a specific zone of support. Note: Prior to entering a manual move order into the AFCS, the new location sectors of fire, if known, should be applied, otherwise the sectors will remain unchanged from previous data entered.

HOWITZER UPDATE (HOW;UPDATE)

B-25. The HOW;UPDATE, when transmitted to the LCU, displays the howitzer location and other firing-related information. The status reported in this format is also displayed in the LCU middle plasma display. The HOW;UPDATE should be compared to the platoon operations and survey overlays when received. If the LCU operator placed an X in REPORT on the HOW;MOVE format, the howitzer automatically reports its location when the COS selects ARRIVE on the AFCS. This is done upon arrival at a survey point (INITAL on the HOW;MOVE), logistic point, or firing area. If the howitzer is moving to a firing point, the reported location should be within 50 meters (E and N) of the firing point. If the howitzer is sent to a firing area, it

should be within the specified radius from the grid sent in the HOW;MOVE. If not, the situation should be investigated, since there may be a problem with the AFCS. Note: After a survivability move within a firing area the HOW;UPDATE is not automatically transmitted when the COS presses the arrive key.

HOWITZER AMMUNITION (HOW;AMOUP)

B-26. The HOW;AMOUP contains the ammunition file for each howitzer. As previously stated, this includes ammunition on the FAASV. If ammunition requires more than one page in the file, the first page when received will have AMOH: X and subsequent pages will have AMOR: X. Upon receipt of each howitzer's ammunition file, the file should be compared to the ammunition breakdown specified by the POC.

AMMUNITION AND FIRE UNIT UPDATE MESSAGE (AFU;UPDATE)
IFSAS

B-27. This format reports platoon location and other tactical information to the battalion IFSAS. If received from IFSAS or another LCU, this format cannot be executed. It is for information purposes only. It is part of the initial setup sequencing and must be executed at that time. Failure to execute this format during setup causes the MAXRNG entries to default to 0. This keeps the LCU from computing ballistic solutions, since the maximum range for each shell type is 0. The CORD and AZ fields reflect averages based on the number of HOW;UPDATEs on file.

HOW;UPDATE AVERAGES

B-28. Each POC must avoid executing the adjacent platoon's HOW;UPDATEs if received, because the CORD and AZ fields reflect averages based on the number of HOW;UPDATES on file. Executing the adjacent platoon's updates can cause gross errors at the battalion AFATDS/IFSAS when the AFU;UPDATE is sent. This does not apply when one LCU must control all six howitzers.

FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;AMMO)

B-29. The AFU;AMMO reports platoon ammunition to AFATDS/IFSAS. Just as with the AFU;UPDATE, the AFU;AMMO cannot be executed when received from AFATDS/IFSAS or another LCU. The AFU;AMMO reflects the total platoon ammunition based on the number of HOW;AMOUPs on file. Do not execute the adjacent platoon HOW;AMOUPs, as this transmits an incorrect AFU;AMMO file to battalion FDC.

REQUEST FOR DATA MESSAGE (HOW;REQUEST)

B-30. This format requests database information from AFCS to LCU or from LCU to AFCS. When received from AFCS, the LCU operator has only to execute the request and the requested information is automatically addressed for transmission. A unique capability of this format is that it allows the LCU operator to request HOW;UPDATEs while the howitzer is moving. When

received by the AFCS, the current howitzer location is transmitted back to the LCU. This allows the POC to track howitzer movement while en route to the next directed location or during survivability moves when in a position area.

SENSOR-TO-SHOOTER OPERATIONS (LINKED)
TARGET ACQUISITION LINKS (HOW;OBSERVER)

B-31. This message links a Paladin howitzer with a TA system. The link allows the howitzer and observer to communicate through the LCU. The observer, the howitzer, and the POC must be on the same frequency.

PRIOR COORDINATION

B-32. Anytime a howitzer is to be linked, prior coordination is essential. This is necessary to determine the amount of control and/or support the observer needs. The following items must be coordinated with the FSO, FIST, FO, or other TA agency:

- Duration of link.
- Requirement to store targets, to include priority targets.
- Target number block to be used. Note: This should be the observer's assigned target number block. Do not use the platoon LCU block unless absolutely necessary.
- Type of ammunition required and number of rounds for adjust phase and FFE phase of all fire mission processing.

COPPERHEAD FIRING

B-33. The most likely situation requiring linked operations is the firing of Copperhead. The FIST, combat observation lasing team (COLT), or Striker may be linked directly to the howitzer. A direct link also may be used for maneuver forces in movement to contact when suppressive fires are needed. Priority targets may be established along the axis of attack and then be deleted and new ones established as the supported unit moves.

LINK SUSPENSION/BREAKAGE

B-34. The POC, using the HOW;OBSR format, establishes as much control as needed during the link and terminates the link by transmitting an updated HOW;SBT. Otherwise, the link is automatically broken upon expiration of the time established in the HOW;OBSR. If the linked observer is processing a fire mission, the termination is suspended until the mission is ended. If the AFCS has a stored priority target (FPF or priority Copperhead), the linked observer cannot establish a priority target until the POC deletes the one previously established. The POC may use the howitzer for fire missions, even if linked, as long as the howitzer is not processing a mission for the linked observer. In all cases, a priority mission (FPF or priority Copperhead) which has been established on the howitzer will override any other mission.

FIRE DIRECTION PROCEDURES

B-35. It is important to understand that Paladin fire mission processing differs from that for cannon artillery units such as the M109A5, M198, and M119. The AFCS is the primary means of technical fire direction except in special situations. If it becomes necessary for the LCU to perform technical fire direction, the operator must first ensure that he has the current howitzer location and ammunition file. The operator must then place an X in the GUNORD field, and an S in the STATUS field of the HOW;UPDATE message format. Once a howitzer is placed in a fire mission status and firing information is transmitted, only a priority mission (FPF or priority Copperhead) will override a mission. If the FDO wishes to override a mission in process, he must direct the LCU operator to end the mission in process or order the AFCS operator to abort the mission if in a degraded mode of operation.

FM;CFF PROCESSING

B-36. The LCU unique fields (data elements which follow the EDT indicator) are very important. Unlike conventional cannon systems, operator input into the LCU reformats the FM;CFF into a HOW;MSN format. This format is for transmission only and cannot be found in the message skeletons. Upon execution of the FM;CFF, the operator sees an FM;CFF addressed to the howitzers specified in the PTF: or SHTF: displayed on the LCU lower display. The LCU is not computing technical firing data, so the RG: field and the MAXORD: field are not filled out. The RPT: field is also very important. Placing an X in this field causes each howitzer to generate a message to observer (MTO), shot, splash, and round complete or ready reports to update the LCU middle display. The decision to place an X in this field causes an increased communications burden on the internal fire direction net because each howitzer is reporting.

FM;CFF:O PROCESSING

B-37. This format is received from IFSAS or another LCU. It differs from the FM;CFF in that the tactical fire control information (such as shell-fuze and number or volleys) is present upon display. Otherwise, operator information is input the same as the FM;CFF.

FM;COMNDS

B-38. This format is produced when the LCU is performing technical fire control. When displayed, this format is automatically addressed for transmission to the howitzer which has GUNORD: X in the HOW;UPDATE. If the LCU database has a combination of GUNORD: X and GUNORD: BLANK in the HOW;UPDATEs, the HOW;MSN will always be prepared for transmission first.

BE ADVISED THAT (BAT) MESSAGES

B-39. The BAT message is used to inform a subscriber of information concerning some action by the AFCS. All messages of this type begin with the text: "BAT-DD:HH:MM (day:hour:minute) - ".

HOW;MOVE

B-40. "BAT-DD:HH:MM- MOVE ORDER "LOCATION OF KNOWN POINT DATA" PENDING DUE TO NAVIGATION ALIGNMENT IN PROGRESS."
HOW;MOVE sent while MAPS is in an alignment mode. Upon completion of alignment, move will be activated.

B-41. "BAT-DD:HH:MM - MOVE ORDER "LOCATION OF KNOWN POINT DATA" PENDING DUE TO ACTIVE MISSION TARGET ID "TARGET NUMBER"."
HOW;MOVE sent while AFCS is in a fire mission. Upon end of mission (EOM), move will be activated.

B-42. "BAT-DD:HH:MM - MOVING TO LOCATION "LOCATION OF NEW POINT" WHICH IS OUTSIDE OF CURRENT MAP."
HOW;MOVE sent with spheroid code which differs from that in the MAP MOD.

B-43. "BAT-DD:HH:MM - BCS COMPUTED PRIORITY TARGET ID "TARGET NUMBER" HAS BEEN DELETED."
BCS computed data for a priority target and stored the data in AFCS. Once the howitzer moves, this data is no longer valid.

HOW;OBSR

B-44. "BAT-DD:HH:MM - OBSERVER "LOGICAL NAME OF OBSERVER" HAS BEEN DELINKED UPON RECEIPT OF RESTRICTIONS FOR OBSERVER."
If HOW;OBSR sent and the logical name of the observer does not match that of the HOW;SBT, then a delink occurs.

B-45. "BAT-DD:HH:MM - OBSERVER "LOGICAL NAME OF OBSERVER" HAS BEEN DELINKED UPON EXPIRATION OF LINK TIME."
HOW;OBSR sent which specified an ending data and time group. A delink has occurred due to expiration of the specified data and time.

HOW;SBT

B-46. "BAT-DD:HH:MM- SUBSCRIBER FILE UPDATE PENDING DUE TO ACTIVE MISSION TARGET ID "TARGET NUMBER "."
HOW;SBT sent during a fire mission. Upon EOM HOW;SBT will be processed.

B-47. "BAT-DD:HH:MM - SUBSCRIBER FILE UPDATED WITH AFCS UNDER CHECKFIRE ID "TARGET NUMBER"."
HOW;SBT sent while AFCS is in a checkfire status.

FM;SUBS (EOM & SURV FOR DIGITAL DEVICE)

B-48. "BAT-DD:HH:MM - EOM "TARGET NUMBER" BDA IS "BDA GIVEN BY OBSERVER"."
EOM sent by linked observer and observer has given battle damage assessment (BDA).

FM;CFF(HOW;MSN)

B-49. "BAT-DD:HH:MM - STORED TOT TARGET "STORED TARGET NUMBER" ACTIVATED."
Activation by the AFCS of a stored time on target mission.

B-50. "BAT-DD:HH:MM - UNEXPECTED SHOT OUT DETECTED."
The AFCS operator has not followed the firing sequence prompted by the AFCS.

CHECKFIRE OR CANCEL CHECKFIRE

B-51. "BAT-DD:HH:MM - ALREADY UNDER CHECKFIRE WITH ID "TARGET NUMBER"."
A checkfire has been sent to AFCS which is already under checkfire.

B-52. "BAT-DD:HH:MM - ENTERED CHECKFIRE STATUS WITH ID "TARGET NUMBER" WHEN NO ACTIVE MISSION."
A checkfire has been sent to AFCS, which is not in a mission, referencing a target number.

B-53. "BAT-DD:HH:MM - ENTERED CHECKFIRE STATUS WITH ID "TARGET NUMBER" WHEN ACTIVE TARGET ID "ACTIVE TARGET NUMBER"."
A checkfire by target number has been sent to AFCS with an active mission and the target numbers do not match.

B-54. "BAT-DD:HH:MM - ENTERED CHECKFIRE STATUS WITH ID "TARGET NUMBER"."
A checkfire by target number has been sent to AFCS and processed.

STORE TO AFCS TARGET FILE

B-55. "BAT-DD:HH:MM - TARGET ID "TARGET NUMBER" STORED."
PTM sent to digital device which has target write permission from HOW;OBSR message.

B-56. "BAT-DD:HH:MM - A NON PRIORITY TARGET WAS DELETED WHICH MATCHED THE STORE PRIORITY TARGET ID "TARGET NUMBER"."
A request to delete a target from the AFCS target storage file.

B-57. "BAT-DD:HH:MM - PRI TARGET "TARGET NUMBER" STORED."
PTM sent to digital device which has target write permission from HOW;OBSR message.

DELETE FROM AFCS TARGET FILE

B-58. "BAT-DD:HH:MM - TARGET ID "TARGET NUMBER" DELETED."
PTM sent to a digital device, requesting deletion of a stored target. Device has been given target write permission from HOW;OBSR message.

B-59. "BAT-DD:HH:MM - ALL NON PRI TGTS DELETED."
PTM sent to a digital device, requesting deletion of all stored targets. Device has been given target write permission from HOW;OBSR message.

MAP MOD

B-60. "BAT-DD:HH:MM - BCS COMPUTED STORED PRIORITY TARGET ID "STORED PRI TARGET NUMBER" WAS DELETED DUE TO CHANGE IN MAP ZONE OR SPHEROID."
BCS transmitted a MAP MOD which changes the zone or spheroid code of AFCS stored priority target computed by BCS.

B-61. "BAT-DD:HH:MM - MAP MODIFICATION COMPLETE."
BCS transmitted a MAP MOD to AFCS.

UNABLE TO EXECUTE (UTE) MESSAGES

B-62. All messages of this type begin with the text: "UTE-DD:HH:MM (day:hour:minute) - ".

CEASE LOAD REQUEST

B-63. "UTE-DD:HH:MM - CEASE LOAD "TARGET NUMBER" DUE TO AFCS UNDER CHECKFIRE."
Command to cease load sent to AFCS which is under checkfire.

B-64. "UTE-DD:HH:MM - CEASE LOAD "TARGET NUMBER" DUE TO NO ACTIVE MISSION."
Command to cease load sent while AFCS is not in an active mission.

B-65. "UTE-DD:HH:MM - CEASE LOAD "TARGET NUMBER" DUE TO ACTIVE MISSION TARGET ID "TARGET NUMBER"."
Command to cease load sent with target number different from active mission in AFCS.

FIRE ON TARGET REQUEST (FIRE)

B-66. "UTE-DD:HH:MM - FIRE REQUEST "TARGET NUMBER" DUE TO AFCS UNDER CHECKFIRE "TARGET NUMBER"."
Request for fire on target sent while AFCS under checkfire.

B-67. "UTE-DD:HH:MM - FIRE REQUEST "TARGET NUMBER" DUE TO ACTIVE MISSION "TARGET NUMBER" NOT AMC."
Request to fire sent when method of control is not at my command (AMC).

B-68. "UTE-DD:HH:MM - FIRE REQUEST "TARGET NUMBER" DUE TO PRIORITY ACTIVE MISSION TARGET ID "TARGET NUMBER."
Request to fire on target number while AFCS is processing a priority fire mission (FPF, Copperhead).

B-69. "UTE-DD:HH:MM - FIRE REQUEST OF STORED TARGET ID "TARGET NUMBER" DUE TO ACTIVE MISSION TARGET ID "TARGET NUMBER."
Request to fire a non priority stored target while AFCS is processing a fire mission and the request to fire does not match active mission nor priority stored target.

FIRE MISSION (HOW;MSN)

B-70. "UTE-DD:HH:MM - FIRE REQUEST "TARGET NUMBER" DUE TO TARGET NOT STORED IN AFCS."
Request to fire on target number which is not stored in AFCS files.

B-71. "UTE-DD:HH:MM - HOW;MSN REQUEST TARGET ID "TARGET NUMBER" DUE TO AFCS UNDER CHECKFIRE - ID "TARGET NUMBER"."
Request to fire sent while AFCS under checkfire.

B-72. "UTE-DD:HH:MM - HOW;MSN REQUEST TARGET ID "TARGET NUMBER" DUE TO ACTIVE PRIORITY MISSION TARGET ID "TARGET NUMBER"."
Request to fire sent while AFCS processing priority mission.

B-73. "UTE-DD:HH:MM - HOW;MSN REQUEST TARGET ID "TARGET NUMBER" DUE TO ACTIVE MISSION TARGET ID "TARGET NUMBER"."
Request to fire sent, which is not a priority mission and target number sent does not match active mission.

B-74. "UTE-DD:HH:MM - HOW;MSN REQUEST TARGET ID "TARGET NUMBER" DUE TO LAST MISSION REQUEST FOR THAT TARGET NOT COMPLETE."
If the AFCS is not awaiting EOM or continuation of mission (as in subsequent corrections then above UTE is sent. An example would be if the AFCS is waiting for the howitzer COS to depress the shot key.

HOWITZER MASK DATA (AFU;MASK)

B-75. "UTE-DD:HH:MM - MASK UPDATE DUE TO OVERLAPPING SEGMENTS IN DEFINITION."
The AFCS has requested its last reported mask data from the BCS and the left and right azimuth limits overlap.

REQUEST FOR DATA (HOW;REQUEST)

B-76. "UTE-DD:HH:MM - SEND TARGET ID "TARGET NUMBER" DUE TO NOT STORED IN AFCS - TARGETS IN AFCS "PRIORITY TARGET NUMBER", "STORED TARGET NUMBER(S)"."
A HOW;REQUEST sent requesting a specific target number but that target number is not stored in the AFCS. The last portion of the UTE message will list the targets stored in the AFCS.

B-77. "UTE-DD:HH:MM - SEND ALL TARGETS DUE TO NO TARGETS ARE STORED IN AFCS."
A HOW;REQUEST sent requesting all targets in AFCS target file because there are none in the AFCS target file.

FIRE COMMANDS (FM;COMNDS)

B-78. "UTE-DD:HH:MM - FM;COMNDS TARGET ID "TARGET NUMBER" AFCS HAS NOT REPORTED STATIONARY STATUS."
BCS has computed data to send to AFCS however, the AFCS has not reported its current location.

B-79. "UTE-DD:HH:MM - FM;COMNDS TARGET ID "TARGET NUMBER" HAS INSUFFICIENT DATA IN THE REQUEST."
BCS has computed data and transmitted it to AFCS however, the howitzer has not been identified in the FU field of the FM:COMNDS message.

B-80. "UTE-DD:HH:MM - FM;COMNDS TARGET ID "TARGET NUMBER" DUE TO ACTIVE PRIORITY MISSION TARGET ID "TARGET NUMBER" IN PROGRESS."
BCS has computed data and transmitted it to AFCS which is currently processing a priority target.

B-81. "UTE-DD:HH:MM - FM;COMNDS TARGET ID "TARGET NUMBER" DUE TO LAST MISSION REQUEST FOR THAT TARGET NOT COMPLETE."
BCS has sent FM:COMNDS requesting that AFCS process mission however, the AFCS is not in a state with which it can process the mission. The howitzer COS has not depressed the "SHOT" and "ROUNDS COMPLETE" when prompted. The AFCS must be at awaiting EOM or continuation of mission to process anything other than a priority mission.

END OF MISSION COMMAND (FM;EOM):

B-82. "UTE-DD:HH:MM - EOM "TARGET NUMBER" DUE TO ACTIVE MISSION TARGET ID "TARGET NUMBER"."
An EOM request is sent to an AFCS and the requested EOM target number does not match the active mission.

B-83. "UTE-DD:HH:MM - EOM "TARGET NUMBER" DUE TO NO ACTIVE MISSION."
An EOM request is sent to an AFCS that has no active mission.

FORWARD OBSERVER COMMAND MESSAGE (FOCMD)

Fire

B-84. "UTE-DD:HH:MM - FIRE TGT IS IN CHECKFIRE."
A request to fire target number is sent to AFCS and AFCS is in a checkfire status.

B-85. "UTE-DD:HH:MM - FIRE TGT IS NOT AMC MISSION."
A request to fire target number is sent to AFCS however, the active mission is not an "at my command" method of control.

B-86. "UTE-DD:HH:MM - FIRE TARGET IS BUSY PRI MSN."
A request to fire target number is sent to AFCS however, the AFCS is processing a priority fire mission.

B-87. "UTE-DD:HH:MM - FIRE BUSY WITH OTHER MSN."
A request to fire target number is sent to AFCS however, the target number does not match the current active mission.

B-88. "UTE-DD:HH:MM - FIRE TGT NOT IN TGT FILE."
A request to fire target number is not in the AFCS target file.

Delete Target

B-89. BCS Version - "UTE-DD:HH:MM - DELETE TARGET ID "TARGET NUMBER" DUE TO NO WRITE TARGET FILE PERMISSION."
Digital Device Version - "UTE-DD:HH:MM - NO TGT DELETE PERMISSION."
A request to delete a target from AFCS target storage file is received however, the HOW;OBSR did not allow target storage permission.

B-90. BCS Version - "UTE-DD:HH:MM - DELETE TARGET ID "TARGET NUMBER" DUE TO NOT STORED IN AFCS - TARGET IN AFCS - "STORED PRIORITY TARGET NUMBER AND STORED TARGET NUMBER(S)."
Digital Device Version - "UTE-DD:HH:MM - DELETE "TARGET NUMBER" NOT STORED."
A request to delete target from AFCS target storage file is received however, the target number does not match target number(s) in file.

LINKED OBSERVER MESSAGES (HOW;OBSR)

B-91. "UTE-DD:HH:MM - ILLEGAL PROJECTILE / FUZE COMBINATION IN "PHASE" OF THE HOW;OBSR RESTRICTIONS."
HOW;OBSR sent with illegal projectile / fuze combination in SHAJ: or SHEF:.

FIRE REQUEST (FR;GRID)

B-92. "UTE-DD:HH:MM - COORD EXPANSION FAILURE."
A request for fire has been sent in short coordinates and either the observer failed to specify the use of grid zone or the MAP MOD does not cover the requested area.

B-93. "UTE-DD:HH:MM - NO TARGET ID "TARGET NUMBER" AVAILABLE."
The AFCS cannot process the fire request due to all target numbers assigned by the HOW;OBSR message have been exhausted.

B-94. "UTE-DD:HH:MM - NOT ADJ PHASE PERMISSION."
The linked observer was not given adjust fire authority on the HOW:OBSR.

B-95. "UTE-DD:HH:MM - ALLOWED SH/FZ VIOLATION."
Linked observer requested an unauthorized shell / fuze combination.

B-96. "UTE-DD:HH:MM - FR;GRID IS IN CHECKFIRE."
A fire mission is sent while the AFCS in under checkfire.

B-97. "UTE-DD:HH:MM - TARGET ID "TARGET NUMBER" MUST BE GIVEN."
If the AFCS is in an active mission then the target number for that mission must be sent before any further processing.

B-98. "UTE-DD:HH:MM - BUSY WITH OTHER MISSION."
A request for fire is received, with a target number, however, the target number does not match the current active mission.

B-99. "UTE-DD:HH:MM - BUSY LAST REQ FOR "TARGET NUMBER"."

If the AFCS is not at the awaiting continuation of mission or end of mission state, then it will not process any other mission except priority.

B-100. "UTE-DD:HH:MM - NO ASSIGN PRI MISSION."
The linked observer does not have target storage permission.

B-101. "UTE-DD:HH:MM - PRI TGT ALREADY ASSIGNED."
A priority target already exists at the AFCS. This may have been assigned by the BCS or previously assigned by the linked observer. In any case the AFCS may only have one priority target.

SUBSEQUENT ADJUSTMENT (SUBQ ADJ)

B-102. "UTE-DD:HH:MM - SA EOM / EOM RAT NOT VALID."
The linked observer has attempted to request EOM or EOM record as target (RAT) with a subsequent adjust (SA) format.

B-103. "UTE-DD:HH:MM - SA IS IN CHECKFIRE."
The AFCS is in a checkfire state and any subsequent adjustment will not be processed.

B-104. "UTE-DD:HH:MM - SA "TARGET NUMBER" DUE TO NO MSN."
The linked observer has attempted subsequent adjustment on a non-active mission.

B-105. "UTE-DD:HH:MM - SA BUSY WITH ANOTHER MISSION."
The linked observer has attempted subsequent adjustment with a target number which matches the current active mission however, the AFCS is not at an awaiting continuation of mission or EOM state.

END OF MISSION AND SURVEILLANCE (EOM&SURV)

B-106. "UTE-DD:HH:MM - EOM TARGET ID REQUIRED."
The linked observer has attempted to end a mission without the active target number.

B-107. "UTE-DD:HH:MM - EOM "TARGET NUMBER" HAS NO ACTIVE MISSION."
The linked observer has requested EOM on a target which is not active in the AFCS.

B-108. "UTE-DD:HH:MM - EOM "TARGET NUMBER" AS WRONG MISSION."
The linked observer has requested EOM with the incorrect target number.

QUICK RESPONSE FIRE REQUEST (FR;QUICK)

Delete

B-109. "UTE-DD:HH:MM - DELETE TARGET ID NEEDED:"
The linked observer has requested the deletion of a target, but no target number is given.

Fire

B-110. "UTE-DD:HH:MM - FIRE TGT IS IN CHECKFIRE."

A request to fire target number is received however, the AFCS is in a checkfire status.

B-111. "UTE-DD:HH:MM - FIRE TGT AS BUSY LAST REQ."
A request to fire target number is received and the AFCS is not at an AMC status.

B-112. "UTE-DD:HH:MM - FIRE TGT AS BUSY PRI MSN."
A priority mission is currently active and a request to fire stored target is received.

B-113. "UTE-DD:HH:MM - FIRE BUSY WITH OTHER MSN."
The request to fire target number does not match the current mission.

B-114. "UTE-DD:HH:MM - FIRE TGT NOT IN TGT FILE."
The requested target is not in target file.

OPERATOR ABORTED FIRE REQUEST

B-115. BCS Version: "UTE-DD:HH:MM - AFCS OPERATOR ABORTED ACTIVE MISSION TARGET ID "TARGET NUMBER"."
The howitzer COS aborted fire mission. This message is sent only to BCS.

B-116. Digital Device Version: "UTE-DD:HH:MM - OPERATOR ABORT ID "TARGET NUMBER"."
The howitzer COS aborted fire mission. This message is sent to digital devices.

TIME ON TARGET (TOT) MISSIONS

B-117. "UTE-DD:HH:MM - STORED TOT REQUEST TARGET ID "TARGET NUMBER" DUE TO AFCS UNDER CHECKFIRE - ID "TARGET NUMBER"."
A stored TOT mission was activated automatically by AFCS however, the AFCS is under checkfire.

B-118. "UTE-DD:HH:MM - STORED TOT REQUEST TARGET ID "TARGET NUMBER" DUE TO ACTIVE PRIORITY MISSION TARGET ID "TARGET NUMBER"."
A stored TOT mission was activated automatically by AFCS however, the AFCS is processing a priority mission (i.e., Copperhead or FPF).

B-119. "UTE-DD:HH:MM - STORED TOT REQUEST TARGET ID "TARGET ID "TARGET NUMBER" DUE TO ACTIVE MISSION TARGET ID "TARGET NUMBER"."
A stored TOT mission was activated automatically by AFCS however, the AFCS is processing a previously requested fire mission.

B-120. "UTE-DD:HH:MM - STORED TOT REQUEST TARGET ID "TARGET NUMBER" DUE TO LAST MISSION REQUEST FOR THAT TARGET NOT COMPLETE."
A stored TOT mission was activated automatically by AFCS and the TOT target number matched the current active mission. If the mission is not awaiting EOM or continuation of mission then it will be unable to be executed.

CHECKFIRE OR CANCEL CHECKFIRE

B-121. "UTE-DD:HH:MM - CANCEL CHECKFIRE ID "TARGET NUMBER" SINCE NO CHECKFIRE EXISTS."
A cancel checkfire by target number was sent to AFCS which was not in checkfire.

B-122. "UTE-DD:HH:MM - CANCEL CHECKFIRE ID "TARGET NUMBER" DUE TO NO MATCH WITH CHECKFIRE ID "TARGET NUMBER"."
A cancel checkfire by target number was sent to AFCS however, the target number did not match. NOTE: A CANALL request will always match. Caution should be used when using CANALL as an undesired cancel checkfire may be sent.

B-123. "UTE-DD:HH:MM - CHECKFIRE REQUEST "TARGET NUMBER" DUE TO AFCS UNDER CHECKFIRE - ID "TARGET NUMBER"."
A request to checkfire by target number is sent to AFCS however, AFCS is already in checkfire.

TARGET FILE STORAGE AND DELETION

B-124. The following messages apply to BCS and digital devices when a link has occurred. (Note: Only one subscriber may have target storage permission, either the BCS or digital device.)

B-125. BCS Version: "UTE-DD:HH:MM - STORE TARGET ID "TARGET NUMBER" DUE TO NOT STORE TARGET FILE PERMISSION."
Digital Device Version: "UTE-DD:HH:MM - NO TARGET STORE PERMISSION."
An attempt is made to store a target in the AFCS file however, target storage permission was not given in the HOW;OBSR.

B-126. BCS Version: "UTE-DD:HH:MM - STORE TARGET ID "TARGET NUMBER" DUE TO CONFLICT WITH STORED PRIORITY TARGET ID "STORED TARGET NUMBER"."
Digital Device Version: "UTE-DD:HH:MM - TARGET ASSIGNED AS PRI."
An attempt is made to store a priority target by target number and the request matches the priority target already in file.

B-127. BCS Version: "UTE-DD:HH:MM - STORE TARGET ID "TARGET NUMBER" DUE TO TARGET LIST FULL."
Digital Device Version: "UTE-DD:HH:MM - TARGET LIST ALREADY FULL."
An attempt is made to store a target however, the AFCS target file is full.

B-128. BCS Version: "UTE-DD:HH:MM - STORE PRIORITY TARGET ID "TARGET NUMBER" DUE TO NO WRITE TARGET FILE PERMISSION."
Digital Device Version: "UTE-DD:HH:MM - NO ASSIGN PRI PERMISSION."
An attempt is made to store a priority target however, target storage permission was not given in the HOW;OBSR.

B-129. BCS Version: "UTE-DD:HH:MM - STORE PRIORITY TARGET IS "TARGET NUMBER" DUE TO EXISTING STORED PRIORITY TARGET ID "TARGET NUMBER"."

Digital Device Version: "UTE-DD:HH:MM - PRI TARGET ALREADY ASSIGNED."

An attempt is made to store a priority target however, a priority target already exists.

Delete All (DELALL)

B-130. BCS Version: "UTE-DD:HH:MM - DELETE ALL TARGETS DUE TO NO WRITE TARGET FILE PERMISSION."

Digital Device Version: "UTE-DD:HH:MM - NO TGT DELETE PERMISSION."

A request to delete all targets from AFCS target storage file is received however, the HOW;OBSR did not allow target storage permission.

MAP MODIFICATION INFLUENCE ON STORED TARGETS

B-131. "UTE-DD:HH:MM - STORED TARGET CANNOT BE CONVERTED TO THE CURRENT MAP MOD."

A request to fire a target from the AFCS target storage file is received however, the target cannot be converted based on current MAP MOD in database.

AMMUNITION SELECTION

B-132. "UTE-DD:HH:MM - SPECIFIED PROJECTILE LOT "PROJECTILE LOT" NOT IN AFCS INVENTORY."

A fire mission message is sent to AFCS and the specified projectile is not in file.

B-133. "UTE-DD:HH:MM - SPECIFIED PROPELLANT LOT "PROPELLANT LOT" NOT IN AFCS INVENTORY."

A fire mission message is sent to AFCS and the specified propellant is not in file.

B-134. "UTE-DD:HH:MM - SPECIFIED FUZE "FUZE MODEL" NOT IN AFCS INVENTORY."

A fire mission message is sent to AFCS and the requested elements do not match what is in the AFCS ammunition inventory.

B-135. "UTE-DD:HH:MM - ILLEGAL PROJECTILE, PROPELLANT, FUZE COMBINATION."

A fire mission message is sent to the AFCS and the request contains illegal combinations for ammunition, propellant, and fuze.

B-136. "UTE-DD:HH:MM - INSUFFICIENT AMMUNITION."

A fire mission message is sent to the AFCS and the howitzer COS was prompted that the requested quantity of ammunition is not on hand. If the COS denies the mission for the above reason, then the above UTE is sent to the BCS.

B-137. When the AFCS receives a fire mission message and more than one of the specified elements is not in file, one of the following UTE messages is sent:

B-138. "UTE-DD:HH:MM - SPECIFIED PROJECTILE LOT "PROJECTILE LOT" PROPELLANT LOT "PROPELLANT LOT" AND FUZE MODEL "FUZE MODEL" NOT IN AFCS INVENTORY."

B-139. "UTE-DD:HH:MM - SPECIFIED PROJECTILE LOT "PROJECTILE LOT" AND PROPELLANT LOT "PROPELLANT LOT" NOT IN AFCS INVENTORY."

B-140. "UTE-DD:HH:MM - SPECIFIED PROJECTILE LOT "PROJECTILE LOT" AND FUZE MODEL "FUZE MODEL" NOT IN AFCS INVENTORY."

B-141. "UTE-DD:HH:MM - SPECIFIED PROPELLANT LOT "PROPELLANT LOT" AND FUZE MODEL "FUZE MODEL" NOT IN AFCS INVENTORY."

PROPELLANT SECTION

B-142. "UTE-DD:HH:MM - PROPELLANT INSUFFICIENT."
A fire mission message is sent to the AFCS and the maximum range of the propellant is compared to the range to the target. If the target range exceeds 85% of that for the propellant (90% for high angle fire) the above UTE is sent to the BCS.

FUZE SELECTION

B-143. "UTE-DD:HH:MM - BECAUSE "FUZE TYPE" NOT IN INVENTORY."
A fire mission message is sent to the AFCS however, no legal fuze is found.

B-144. "UTE-DD:HH:MM - NO LEGAL AMMUNITION COMBINATIONS INVENTORY."
A fire mission message is sent to the AFCS however, the AFCS found no legal combinations for projectile, powder, and fuze.

CHARGE SELECTION

B-145. "UTE-DD:HH:MM - EXCESSIVE RANGE TO TARGET."
A fire mission message is sent to AFCS and the target range exceeded 85% of the range of the powder model (90% for high angle fire).